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10 cm. per hour at the highest vacua. Hence the air within is permanently slightly *hotter* than the outside, because of the influx. Fig. 7 shows the total excursions or double amplitudes of the mass  $m$ , when the ball  $M$  is passed from one side to the other of  $m$ , in half hour periods. The graph is a little rough because the  $\Delta y$  for the plenum would not be quite constant and the influx can not be perfectly controlled in flow; but the evidence is none the less definite. Conceding that the region between  $M$  and  $m$  is *cold* relatively to the other side of  $m$ , there is always a radiant pressure excess on the cold side of  $m$ , increasing nearly at the same rate as the air pressure  $p$  decreases. In the high vacua the effect seems even to be accentuated so that gravitational attraction is all but wiped out.

Nothing of the inversion so clearly brought out by Figs. 3 to 6 appears in Fig. 7. In place of it the plenum radiant pressure on the cold side increases steadily, even into vanishing air pressure,  $p$ , so far as observed.

If one computes the work done by the influx of but 10 cm. per hour, so nearly isothermal, as  $Rm\tau \log(p'/p)$  in the usual notation ( $\tau$  being absolute temperature), it is about the same for all the points of Fig. 7. The case therefore would always be heated alike, within. On the other hand the temperature increment  $\Delta\theta$  of the inside air, in the *absence* of all radiation, may by an easy integration be found to be  $\Delta\theta = (R\tau/Jk) \log(p'/p)$  and this increases as  $\log(p'/p)$ , about seven times between the plenum and the high exhaustions;<sup>1</sup> but it is hard to discern how temperature, as such, not considered as an index of the available heat, has anything to do with it, unless there is some other kind of radiation associated with temperature. True, when temperature differ-

<sup>1</sup> The temperature increments of the inside air, barring radiation, are  $14^\circ$  at  $p=40$  and about  $100^\circ$  at  $p=7$  cm. What is effective, is the residue, after one half hour's radiation, or more, of this thin air. It seems incredible that such infinitessimals can leave so striking a record as figure 7. In fact, most of the straightforward explanations which I have given for the sake of a cohesive argument, if examined critically, are far from satisfactory.

ences decrease indefinitely, the times of cooling must increase indefinitely; and the meaning of infinity here depends on the delicacy of the instrumentation. But the results thus far do not show whether the temperature effect is absolute or relative and I have not therefore been able to get the mastery of the suspicion that observation of the type of Figs. 1 and 2, made under better conditions, daily, for a period of years, would be worth while.

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### THE PHILADELPHIA MEETING OF THE AMERICAN CHEMICAL SOCIETY

THE fifty-eighth meeting of the American Chemical Society was held in Philadelphia, Pa., from September 2 to 6, 1919, inclusive, the general meeting beginning on the morning of Wednesday, September 3, at the Bellevue-Stratford Hotel.

Local arrangements had been under the charge of the committee headed by George D. Rosengarten and members and guests were bountifully entertained. One thousand six hundred and eighty-seven members and guests registered for the meeting. A considerable additional number of members of the society came from the surrounding cities and towns for special parts of the program but did not register. Fully 2,000 were in attendance.

An interesting innovation of the Philadelphia Section consisted in the daily publication of the *Catalyst*, which is the official bulletin of the Philadelphia and Delaware Sections. This daily paper contained news items, lists of members and guests, the daily programs, reports of various meetings and other entertaining matter.

The general meeting opened with an address of welcome by Honorable Joseph S. McLaughlin, of the city of Pennsylvania, to which President Nichols responded. A large audience completely filling the Ball Room of the Bellevue-Stratford Hotel, listened to the address by Honorable Newton D. Baker, Secretary of War, on "Chemistry in Warfare," and to an address on "Chemistry and the Navy," by Rear Admiral Ralph Earle, chief, Bureau of Ordnance, U. S. Navy. These addresses will be found in the October number of the *Journal of Industrial and Engineering Chemistry*, together with additional details of the Philadelphia meeting.

In the afternoon of Wednesday, the following general papers were presented before the whole society:

1. H. J. Wheeler. Some problems and methods in agricultural research.
2. W. V. Bovie. Some physiological effects produced by radiating definite regions within a single cell.
3. Earle B. Phelps. Stream pollution and its relation to the chemical industries.
4. W. D. Harkins. The building of atoms and the periodic systems.
5. Robert P. Fischelis. The chemical laboratory as a publicity factor.

On Wednesday night the largest smoker ever held by the American Chemical Society at which some 1,300 were present, was enjoyed by all. The program consisted of popular songs, a series of interesting films from the various studios, among others introducing for the first time films showing the growth characteristic of snow crystals; descriptions by Mr. Edward James Cattell, of Philadelphia, interspersed with songs by Henri Scott, of the Metropolitan Company. A special feature of the program was an original play representing early chemists meeting in Philadelphia, being based on the historical fact that the American Philosophical Society gave a dinner to Dr. Joseph Priestly in 1803, at which time Hare's oxhydrogen blowpipe was demonstrated to him opening up a new field of chemical investigation. There were also other interesting features.

The address of President William H. Nichols on "Research and application," given in the Museum of the University of Pennsylvania, on Thursday, September 4, drew a large audience. The address was printed in the issue of *SCIENCE* for last week.

The banquet held at the Bellevue-Stratford Hotel Friday night was one of the largest held by the society, with its brilliant company, good food and bright after-dinner speeches.

Abstracts of papers presented before the divisions will be printed in *SCIENCE*.

#### MEETING OF THE COUNCIL

The council of the American Chemical Society met at the Bellevue-Stratford Hotel, Philadelphia, Pa., 4 P.M., on September 2, with President Nichols in the chair and 97 councilors present.

A. B. Lamb was reelected editor of the *Journal* of the American Chemical Society and the present board of associate editors was continued. Charles H. Herty was reelected editor of the *Journal of Industrial and Engineering Chemistry*; E. J. Crane, editor of *Chemical Abstracts*; Charles L.

Parsons, secretary, and B. C. Hesse, a member of committee on national policy for a term of two years.

It was voted that the spring meeting for 1920 be held in St. Louis, and the 1920 fall meeting in Chicago.

The report of the committee on the preparation of a list recommending chemical texts for libraries was presented and accepted.

A committee consisting of Charles Baskerville, F. P. Venable, Julius Stieglitz, W. D. Bancroft and M. T. Bogert, was appointed to draw up resolutions on the death of Lord Rayleigh, an honorary member of our society.

The following by-law having been sent to all members of the council on August 1, was passed unanimously after extended discussion:

No person shall become a member of any Division who is not a member of the American Chemical Society; but Divisions may have associate members not members of the American Chemical Society who shall be entitled to all the privileges of the Division, save that of voting for officers; provided that such associate members shall not be entitled to any of the other privileges of the American Chemical Society, and shall pay such dues, of not less than two dollars per annum, as the Division may require.

A report of the American delegates to the Inter-allied Chemical Conference held in London, July 14 to 17 and Brussels, July 22, was presented to the council by E. W. Washburn. The substance of this report will be found in the *Journal of Industrial and Engineering Chemistry*, and in *SCIENCE*.

President Nichols announced that the Army and Navy Departments had responded enthusiastically to the idea that the American Chemical Society furnish certain lectures on chemical subjects to be given at the West Point and Annapolis academies and that he had received a list of the subjects and the individuals which the officials of the academies desired.

Editor E. J. Crane spoke on the plans of the committee on nomenclature, spelling and pronunciation and stated that the committee hoped to take this matter up also with other chemical societies using the English language in the hope that some coordination between them might be obtained. Referring to this matter the following motion was passed:

That the president of the American Chemical Society invite on behalf of the council of the society the governing bodies of the Chemical Society (London) and the Society of Chemical Industry to appoint a committee, or committees, on nomenclature, spelling and pronunciation to cooperate with the corresponding committee of the American

Society in order to secure as large a measure of agreement in these fields as is practical.

A communication was presented to the council from Munn and Company, New York, in regard to their plans for a development of the *Scientific American Supplement* asking the support and aid of the American Chemical Society in regard to chemical material appearing therein. After extended discussion, the following motion was presented to the council; was laid on the table and was made a special order for the spring meeting:

That as a general policy the society do not lend its name to any private undertaking for profit. This will not preclude contracts with private concerns to carry out undertakings of the society.

It was also voted

That a committee of three be appointed to study the question of possible relations between the American Society and certain scientific publications and report to the next meeting of the council.

The American Chemical Society of a membership of over 13,500 American chemists to-day by its authorized representatives unanimously adopted the following:

WHEREAS, the recent war has clearly demonstrated that the advancement of science through competently directed research in military problems is indispensable to the security of the nation, and

WHEREAS, the bill recently introduced into Congress (Senate 2715, 66 Congress—by the General Staff of the Army providing for universal military service and the reorganization of the Army is of such scope and effect as to inevitably impede the development of all technical and scientific work of the Army by placing it under the absolute control and direction of purely military officers who do not have the requisite scientific knowledge, and

WHEREAS, an organization so constituted could not function efficiently and in time of stress would prove to be an element of fatal weakness and could never hope to attract to itself those scientific and technical experts without whose aid modern warfare can not be successfully conducted.

Now therefore, be it resolved that the American Chemical Society emphatically protests against this or any other bill which does not provide for commissioning staff officers in the corps and departments in which they are to serve and which does not accord to the technical man the same recognition and opportunity throughout every grade and department of the Army as are accorded to the man trained for a military career only.

The secretary presented to the council a summary of some important matters contained in the bill introduced by the general staff of the Army in the 66th Congress, known as Senate Bill 2715, pointing out that technically trained men were not given the same privileges in the plans for the organization of the War Department which were given to line officers. After discussion the following resolutions, prepared by a committee consisting of B. C.

Hesse, M. T. Bogert and Charles L. Reese were unanimously passed:

The following resolutions were presented and adopted by the council:

WHEREAS, the American Chemical Society is convinced that the compensation of the chemist in the national and states service, like that of the university investigator in chemistry, is far below that received in the chemical industries, and

WHEREAS, the government can not maintain an efficient chemical service unless it offers adequate compensation to its chemists, and

WHEREAS, various agencies are now at work toward remedying this situation, and

WHEREAS, the Congressional Commission on Reclassification of Federal Employees is one of these agencies,

Be it therefore resolved, that the American Chemical Society hereby pledges its cooperation with Congress and with the Commission of Reclassification of Federal Employees with all other agencies with like endeavor and urges upon them the vital necessity to the welfare of this country of remedying the present situation, and

Be it further resolved, that copies of this resolution be sent to the Commission of Reclassification of Employees, the press, and be published in the *Journal of Industrial and Engineering Chemistry*.

As a result of these resolutions it was voted

That the President appoint a committee of three with power, directing them to cooperate with the Commission of Reclassification of Federal Employees and to furnish them with any available data and to take such action with the commission and other agencies as shall be thought wise in furthering the ends set forth in the resolution.

The president appointed W. D. Bancroft, W. D. Bigelow and Chas. L. Parsons.

It was voted that the secretary send the members of the council copies of resolutions regarding Senate Bill 2715 with a request that they take up same with their senators and congressmen and that they bring the matter also to the attention of other members of their local sections.

CHARLES L. PARSONS,  
Secretary

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